

### SUPPORT FOR THE AMENDMENT

This Amendment amends the specification by replacing the original abstract with the original abstract; cancels Claim 9; amends Claims 1-3, 5-8, and 10-16; and adds new Claim 17. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 1 is found in the specification at least at page 36, Table 1 and Figs. 2 and 4. Support for new Claim 17 is found in Claim 1 and in the specification at least at page 2, line 22 ("sintering"). No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-3, 5-8 and 10-17 will be pending in the application. Claim 1 is independent.

### REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

Applicants thank the Examiner for the courtesies extended to their representative during the August 12, 2003, personal interview.

As discussed at the personal interview, the present invention provides a ceramic heater that can be used for producing and examining semiconductor devices. The ceramic heater includes a ceramic substrate, made of a non-oxide ceramic containing 0.05 to 5% by weight of oxygen, and a resistance heating element on the ceramic substrate or inside the ceramic substrate. By keeping the maximum pore size in the non-oxide ceramic no greater than 5  $\mu\text{m}$ , dielectric breakdown at high temperatures (e.g., 450°C) can be prevented.

Claims 1, 5, 9-11, 13-14 and 16 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,408,574 ("Deevi") in view of U.S. Patent No. 6,182,340 B1 ("Bishop"), U.S.

Patent No. 6,107,638 ("Sumino-638"), U.S. Patent No. 6,086,990 ("Sumino-990") and U.S. 2002/0010073 A1 ("Beall"). Claims 2-3 are rejected under 35 U.S.C. § 103(a) over Deevi in view of Bishop, Sumino-638, Sumino-990 and Beall and further in view of U.S. Patent No. 6,176,140 B1 ("Autenrieth"). Claim 6 is rejected under 35 U.S.C. § 103(a) over Deevi in view of Bishop, Sumino-638, Sumino-990 and Beall and further in view of U.S. Patent No. 5,492,730 ("Balaba"). Claim 7 is rejected under 35 U.S.C. § 103(a) over Deevi in view of Bishop, Sumino-638, Sumino-990 and Beall and further in view of U.S. Patent No. 5,843,589 ("Hoshiya"). Claims 8, 12 and 15 are rejected under 35 U.S.C. § 103(a) over Deevi in view of Bishop, Sumino-638, Sumino-990 and Beall and further in view of U.S. Patent No. 5,310,453 ("Fukasawa").

The Office Action admits that Deevi fails to disclose a ceramic substrate having a porosity and a pore diameter. Office Action at page 3, lines 6-7. The Office Action relies on Beall for teaching "a pore diameter of 50  $\mu\text{m}$  or less (page 1, paragraph [0011])". Office Action at page 3, lines 11-12.

Beall at paragraph [0011] discloses:

... The ceramic bodies formed by this Merkel reference exhibited thermal expansion coefficients of less than about  $4 \times 10^{-7}/^{\circ}\text{C}$ . from about 25 to about  $1000^{\circ}\text{C}$ ., a porosity greater than about 42% and a **median pore diameter of between about 5 to 40  $\mu\text{m}$** ; .... Beall at paragraph [0011] (emphasis added).

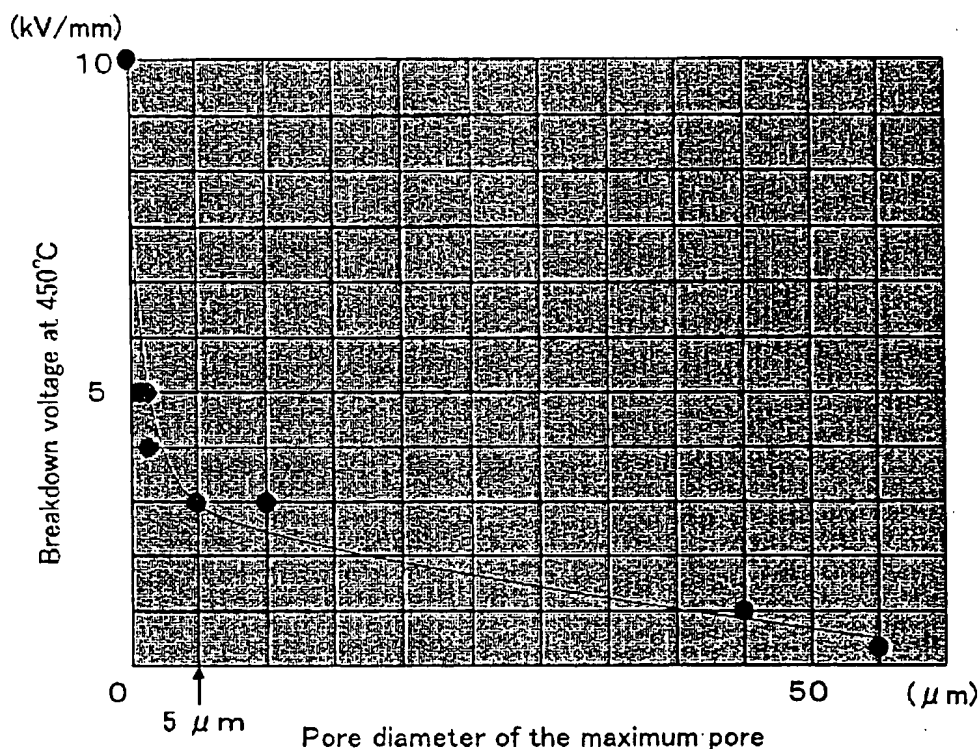
The term "median" can be defined as:

An average of a series of quantities or values; specifically, the quantity or value of that item which is so positioned in the series, when arranged in order of numerical quantity or value, that there are an equal number of items of greater magnitude and lesser magnitude. McGraw-Hill Dictionary of Scientific and Technical Terms, Fifth Edition, page 1232, copy attached.

Because a "median pore diameter" is completely different than a "maximum pore diameter", Beall's disclosure of a "median pore diameter" fails to suggest the "maximum pore diameter" recited in independent Claim 1.

Because Beall, and the other cited references, fail to suggest the independent Claim 1 limitation that "the non-oxide ceramic has a **maximum pore diameter** of 5  $\mu\text{m}$  or less", the various rejections under 35 U.S.C. § 103(a) should be withdrawn.

Any *prima facie* case for the obviousness of independent Claim 1 is rebutted by the significant improvement in breakdown voltage at 450°C, illustrated in the following graph drawn from Tables 1-2 using the eight examples with 1.6 % by weight oxygen, that is achieved by the present invention when the maximum pore diameter is 5  $\mu\text{m}$  or less.



Because the cited prior art fails to suggest the significant improvement in high temperature breakdown voltage achieved by the present invention, any *prima facie* case of obviousness based on the cited prior art is rebutted.

Claim 1 is rejected under 35 U.S.C. § 112, second paragraph. To obviate the rejection, Claim 1 is amended.

The specification is objected to as not containing an abstract. Applicants respectfully traverse the objection because the original specification included an abstract. Nevertheless, to obviate the objection, the specification is amended by replacing the original abstract with the original abstract.

Pursuant to MPEP § 821.04, after independent product Claim 1 is allowed, Applicants respectfully request examination and allowance of new method Claim 17, which includes all of the limitations of product Claim 1.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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Attachment:

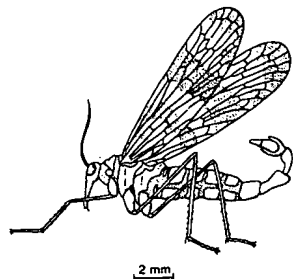
McGraw-Hill Dictionary of Scientific and Technical Terms, Fifth Edition, page 1232



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## MECOPTERA

Male scorpion fly (*Panorpa*).

in the fetal intestine, becoming the first fecal discharge of the newborn. { mə'kō-nē-əm }

**meconium ileus** [MED] Intestinal obstruction in the newborn with cystic fibrosis due to trypsin deficiency. { mə'kō-nē-əm 'il-ē-əs }

**Mecoptera** [INV ZOO] The scorpion flies, a small order of insects; adults are distinguished by the peculiar prolongation of the head into a beak, which bears chewing mouthparts. { me'kāp-tə-rə }

**mecystasis** [PHYSIO] Increase in muscle length with maintenance of the original degree of tension. { me'sis-tə-səs }

**media** [HISTOL] The middle, muscular layer in the wall of a vein, artery, or lymph vessel. { 'mē-dē-ə }

**media conversion** [COMPUT SCI] The transfer of data from one storage type (such as punched cards) to another storage type (such as magnetic tape). { 'mē-dē-ə kən,vər-zhən }

**media conversion buffer** [COMPUT SCI] Large storage area, such as a drum, on which data may be stored at low speed during nonexecution time, to be later transferred at high speed into core memory during execution time. { 'mē-dē-ə kən,vər-zhən ,baf-ər }

**mediad** [ANAT] Toward the median line or plane of the body or of a part of the body. { 'mē-dē,ad }

**medial** [ANAT] 1. Being internal as opposed to external (lateral). 2. Toward the midline of the body. [SCI TECH] Located in the middle. { 'mē-dē-əl }

**medial arteriosclerosis** [MED] Calcification of the tunica media of small and medium-sized muscular arteries. Also known as medial calcinosis; Mönckeberg's arteriosclerosis. { 'mē-dē-əl ,ärtir-ē-ō-sklə'rō-səs }

**medial calcinosis** See medial arteriosclerosis. { 'mē-dē-əl ,kal-sə'nō-səs }

**medial lemniscus** [ANAT] A lemniscus arising in the nucleus gracilis and nucleus cuneatus of the brain, crossing immediately as internal arcuate fibers, and terminating in the posterolateral ventral nucleus of the thalamus. { 'mē-dē-əl lem'nis-kəs }

**medial moraine** [GEOL] 1. An elongate moraine carried in or upon the middle of a glacier and parallel to its sides. 2. A moraine formed by glacial abrasion of a rocky protuberance near the middle of a glacier. { 'mē-dē-əl mə'rān }

**medial necrosis** [MED] Death of cells in the tunica media of arteries. Also known as medionecrosis. { 'mē-dē-əl ne'krō-səs }

**media migration** [CHEM ENG] Carryover of fibers or other filter material by liquid effluent from a filter unit. { 'mē-dē-ə mī'grā-shən }

**median** [MATH] 1. Any line in a triangle which joins a vertex to the midpoint of the opposite side. 2. The line that joins the midpoints of the nonparallel sides of a trapezoid. Also known as midline. [SCI TECH] Located in the middle. [STAT] An average of a series of quantities or values; specifically, the quantity or value of that item which is so positioned in the series, when arranged in order of numerical quantity or value, that there are an equal number of items of greater magnitude and lesser magnitude. { 'mē-dē-ən }

**median effective dose** See effective dose 50. { 'mē-dē-ən i'fek-tiv 'dōs }

**median infective dose** See infective dose 50. { 'mē-dē-ən in'fek-tiv 'dōs }

**median lethal dose** See lethal dose 50. { 'mē-dē-ən 'lēth-əl 'dōs }

**median lethal time** [MICROBIO] The period of time required for 50% of a large group of organisms to die following a specific dose of an injurious agent, such as a drug or radiation. { 'mē-dē-ən 'lēth-əl ,tīm }

**median mass** [GEOL] A less disturbed structural block in the middle of an orogenic belt, bordered on both sides by orogenic structure, thrust away from it. Also known as betwixt mountains; Zwischengebirge. { 'mē-dē-ən 'mas }

**median maxillary cyst** [MED] Cystic dilation of embryonal inclusions in the incisive fossa or between the roots of the central incisors. Also known as nasopalatine cyst. { 'mē-dē-ən 'mak-sə,lər-ē ,sist }

**median nasal process** [EMBRYO] The region below the frontonasal sulcus between the olfactory sacs; forms the bridge and mobile septum of the nose and various parts of the upper jaw and lip. { 'mē-dē-ən 'nāz-əl ,prə'səs }

**median nerve test** [MED] A test for loss of function of the median nerve by having the patient abduct the thumb at right

angles to the palm with fingertips in contact and forming a pyramid. { 'mē-dē-ən 'nərv ,test }

**median particle diameter** [GEOL] The middlemost particle diameter of a rock or sediment, larger than 50% of the diameter in the distribution and smaller than the other 50%. { 'mē-dē-ən 'pārd-ə-kəl dī'am-əd-ər }

**median point** [MATH] The point at which all three medians of a triangle intersect. { 'med-ē-ən ,pōint }

**median strip** [CIV ENG] A paved or planted section dividing a highway into lanes according to direction of travel. { 'mē-dē-ən 'stri:p }

**mediastinitis** [MED] Inflammation of the mediastinum. { ,mē-dē,as-tə'nid-əs }

**mediastinum** [ANAT] 1. A partition separating adjacent parts. 2. The space in the middle of the chest between the two pleurae. { ,mē-dē-ə'stī-nəm }

**medical bacteriology** [MED] A branch of medical microbiology that deals with the study of bacteria which affect human health, especially those which produce disease. { 'med-ə-kəl bak,tir-ē'āl-ə-jē }

**medical chemical engineering** [CHEM ENG] The application of chemical engineering to medicine, frequently involving mass transport and separation processes, especially at the molecular level. { 'med-ə-kəl 'kem-ə-kəl ,en-jə'nir-iŋ }

**medical climatology** [MED] The study of the relation between climate and disease. { 'med-ə-kəl ,klī-mə'täl-ə-jē }

**medical electronics** [ELECTR] A branch of electronics in which electronic instruments and equipment are used for such medical applications as diagnosis, therapy, research, anesthesia control, cardiac control, and surgery. { 'med-ə-kəl i,lek'trən-iks }

**medical entomology** [MED] The study of insects that are vectors for diseases and parasitic infestations in humans and domestic animals. { 'med-ə-kəl ,en-tə'mäl-ə-jē }

**medical ethics** [MED] Principles and moral values of proper medical conduct. { 'med-ə-kəl 'eth-iks }

**medical examiner** [MED] A professionally qualified physician duly authorized and charged by a governmental unit to determine facts concerning causes of death, particularly deaths not occurring under natural circumstances, and to testify thereto in courts of law. { 'med-ə-kəl ig'zam-ən-ər }

**medical frequency bands** [COMMUN] A collection of radio frequency bands allocated to medical equipment in the United States. { 'med-ə-kəl 'frē-kwən-sē ,bānz }

**medical genetics** [GEN] A field of human genetics concerned with the relationship between heredity and disease. { 'med-ə-kəl jə'ned-iks }

**medical geography** [MED] The study of the relation between geographic factors and disease. { 'med-ə-kəl jē'āgr-ə-fē }

**medical history** [MED] An account of a patient's past and present state of health obtained from the patient or relatives. { 'med-ə-kəl 'his-trē }

**medical imaging** [MED] The production of visual representations of body parts, tissues, or organs, for use in clinical diagnosis; encompasses x-ray methods, magnetic resonance imaging, single-photon-emission and positron-emission tomography, and ultrasound. { 'med-ə-kəl 'im-iŋ-iŋ }

**medical microbiology** [MED] The study of microorganisms which affect human health. { 'med-ə-kəl 'mīkrō-bī'āl-ə-jē }

**medical mycology** [MED] A branch of medical microbiology that deals with fungi that are pathogenic to humans. { 'med-ə-kəl mī'käl-ə-jē }

**medical parasitology** [MED] A branch of medical microbiology which deals with the relationship between humans and those animals which live in or on them. { 'med-ə-kəl ,parə-si'täl-ə-jē }

**medical protozoology** [MED] A branch of medical microbiology that deals with the study of Protozoa which are parasites of humans. { 'med-ə-kəl ,prō-dō-zō'āl-ə-jē }

**medical radiography** [MED] The use of x-rays to produce photographic images for visualizing internal anatomy as an aid in diagnosis. { 'med-ə-kəl ,rād-ē'āgr-ə-fē }

**medication** [MED] 1. A medicinal substance. 2. Treatment by or administration of a medicine. { ,med-ə'kā-shən }

**medicinal** [MED] Of, pertaining to, or having the nature of medicine. { mə'dis-ən-əl }

**medicinal oil** [MATER] A highly refined, colorless, tasteless and odorless petroleum oil used medicinally as an internal lu-

On the cover: Photomicrograph of crystals of vitamin B<sub>12</sub>.  
(Dennis Kunkel, University of Hawaii)

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In addition, material has been drawn from the following references: R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; *U.S. Air Force Glossary of Standardized Terms*, AF Manual 11-1, vol. 1, 1972; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, 1st ed., National Aeronautics and Space Administration, 1965; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology, White Sands Missile Range, New Mexico*, National Bureau of Standards, AD 467-424; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, 1st ed., Department of Defense, 1967; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Glossary of STINFO Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; *ADP Glossary*, Department of the Navy, NAVSO P-3097.

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